

Docket No.: YOR919990336US2  
(20140-00300-US)  
(PATENT)

**BEFORE THE USPTO BOARD OF PATENT APPEALS AND INTERFERENCES  
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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**FEB 17 2004**

In re Patent Application of:  
Chao-Kun Hu

Conf. No. 8304

Application No.: 10/054,605

Group Art Unit: 2815

Filed: November 13, 2001

Examiner: Paul E. Brock, II

For: REDUCED ELECTROMIGRATION AND  
STRESS INDUCED MIGRATION OF COPPER  
WIRES BY SURFACE COATING

**OFFICIAL**

**REPLY BRIEF**

**Mail Stop Appeal Brief - Patents**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is a Reply Brief in response to the Examiner's Answer dated December 17, 2003.

Concerning the rejections of claims 1-7, 18, 19, 20 and 21 as being unpatentable under 35 U.S.C. § 103(a) over U.S. Patent 5,695,810 to Dubin et al. in view of U.S. Patent no. 6,077,774 to Hong; of claims 1, 9, 10, 18, 26 and 27 as being unpatentable over U.S. Patent No. 6,772,633 to Maydan et al. in view of U.S. Patent No. 6,077,774 to Hong and of claims 1, 2, 18 and 19 as being unpatentable over U.S. Patent No. 6,180,523 to Lee in view of U.S. Patent No. 6,077,774 to Hong, Hong is not properly combinable with any one of Dubin, Mayden and Lee. The mere fact that the layer of Hong, which is necessarily formed by a specific chemical vapor deposition technique, has a thickness of 9 microns is not sufficient to teach that other materials necessarily

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created by vastly different techniques could or should have the same thickness. The Examiner's statements suggesting that Hong's use of different materials and processes than the primary references do not render the combinations improper are misplaced. The failure of the Examiner to consider the references and art as a whole as contrasted to the piecemeal interpretation relied upon by the Examiner is not proper.

Moreover, the Examiner's statement that the originally filed specification does not discuss the criticality of the thickness is incorrect. In particular, the original disclosure states:

The thickness of the coating film on the copper surface must be small: maximum 20 nm, and preferably between 1 and 10 nm due to damascene process considerations. In this way, at least three major properties are achieved: a) the resistivity of the Cu line is not affected or increased by more than 20%, b) the electrical leakage, which may occur due to bridging between Cu conductors, is eliminated and c) no further planarization of the Cu conductor or line is necessary.

With respect to the rejection of claims 1, 2, 3, 4, 18, 19, 20 and 21 as being unpatentable over U.S. Patent No. 5,695,810 to Dubin in view of U.S. Patent No. 6,077,774 to Hong, it seems apparent that the CoWP layer 17 according to Dubin is 150 - 200 nm thick. In particular, the paragraph at column 6, lines 6-23 refers to the CoWP films in general and their method of deposition and is not limited to layer 15. Column 6, line 22 discloses the 150-200 nm thickness. Moreover, column 7, lines 42-46 clarify that the deposition discussion from column 6 also relates to layer 17. For instance, Column 7, lines 44-46 states:

"The preferred solution for electrolessly depositing the second barrier layer 17 is the electroless CoWP solution earlier described."

Concerning the rejections of claims 5, 7, 22, 24, 37 and 38 as being unpatentable over U.S. Patent No. 5,695,810 to Dubin in view of U.S. Patent No. 6,077,774 to Hong and in view of U.S. Patent 5,674,787 to Zhao and of claims 8, 25, 35 and 36 as being unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,180,523 to Lee in view of U.S. Patent No. 6,077,774 to Hong and in view of U.S. Patent No. 5,674,787 to Zhao, the Examiner's statement that it is not

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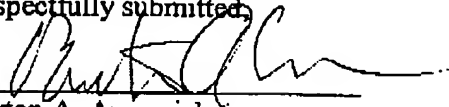
### CONCLUSION

In view of the above and our Appeal Brief, it is abundantly clear that the Primary Examiner has erred in finally rejecting claims 1-5, 7-10, 18-22, 24-27 and 35-38. Accordingly, it is hereby requested that the Board reverse the Examiner and allow claims 1-5, 7-10, 18-22, 24-27 and 35-38.

The Commissioner is hereby authorized to charge any fees or credit any overpayment associated with this communication including any extension fees to Deposit Account No. 50-0510.

Dated: 2-12-04

Respectfully submitted,

By   
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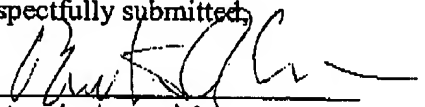
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